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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/050,776	01/18/2002	Akira Hamamatsu	520.41064X00	9567
20457	7590	10/15/2004		
ANTONELLI, TERRY, STOUT & KRAUS, LLP 1300 NORTH SEVENTEENTH STREET SUITE 1800 ARLINGTON, VA 22209-9889			EXAMINER STAFIRA, MICHAEL PATRICK	
			ART UNIT 2877	PAPER NUMBER

DATE MAILED: 10/15/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/050,776

Applicant(s)

HAMAMATSU ET AL.

Examiner

Michael P. Stafira

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on amendment filed August 5, 2004.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-23,26,27 and 29 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 13-23 is/are allowed.
- 6) ☒ Claim(s) 1,2,4-12,26 and 29 is/are rejected.
- 7) ☒ Claim(s) 3 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Priority*

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

### *Claim Rejections - 35 USC § 102*

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1, 2, 4-12, 26, 29 are rejected under 35 U.S.C. 102(e) as being anticipated by Ishimaru et al. (2001/0030296).

The applied reference has a common assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C.

102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention “by another,” or by an appropriate showing under 37 CFR 1.131.

### **Claim 1**

Ishimaru et al. (2001/0030296) a stage (Fig. 1, Ref. 15) on which an object (Fig.1, Ref. 10) to be inspected is mounted; an illumination optical system comprising; a high-angle

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illumination system which illuminates light on surface of the object to be inspected with desired luminous flux from a high-angle relative to the surface of the object (Page 2, Para. 0015); and a low-angle illumination system which illuminates light on the surface of the object to be inspected with desired luminous flux from a low-angle relative to said high-angle illumination system (Page 2, Para. 0015); a detection optical system (See Fig. 10) comprising; an image formation optical system (Fig. 1, Ref 5) which condenses light scattered from the surface of the object by the illumination of the high-angle illumination system and said low-angle illumination system; and a photoelectric conversion unit which receives the scattered light, of which image formation has been performed in the image formation optical system to convert the scattered light into a first luminance signal corresponding to said light illuminated by said high-angle illumination optical system and a second luminance signal corresponding to said light illuminated by said low-angle illumination optical system (Page 4, Para. 0062); and a comparison and judgment unit (Fig. 1, Ref. 8) which classifies defects on the object to be inspected into scratches, thin-film-like foreign materials and convex-defects by using the first luminance signal and the second luminance signal, which have been converted by the photoelectric conversion unit of the detection optical system (Page 5, Para. 0067).

**Claim 2**

Ishimaru et al. (2001/0030296) further discloses the incident illumination system of the illumination optical system is configured so that stray light is not generated from the high-angle image information optical system (See Fig. 1, Ref. 11).

**Claim 4**

The reference of Ishimaru et al. (2001/0030296) further discloses that the comparison and

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judgment unit, the correlation between the first luminance signal and the second luminance signal is used to classify the defects into scratches, thin-like foreign materials and convex defects (Page 9, Para. 0095).

**Claim 5**

Ishimaru et al. (2001/0030296) further discloses the comparison and judgment unit is configured to classify concave defects into scratches and thin film-like foreign materials on the basis of data in response to a defect size calculated by the first luminance signal and the second luminance signal (See Fig. 2a).

**Claim 6**

Ishimaru et al. (2001/0030296) further discloses the comparison and judgment unit is configured to classify foreign materials, which are convex defects, into a small group and a large group on the basis of data in response to a defect size calculated by the first luminance signal and the second luminance signal (See Fig. 2b).

**Claim 7**

The reference of Ishimaru et al. (2001/0030296) further discloses the comparison and judgment unit is configured to judge that the classified convex defect occurs inside a circuit pattern area (See Fig. 2b).

**Claim 8**

Ishimaru et al. (2001/0030296) further discloses the comparison and judgment unit has a displaying unit, which displays information of defects, be classified by the comparison and judgment unit (Fig. 1, Ref. 33).

**Claim 9**

The reference of Ishimaru et al. (2001/0030296) further discloses the comparison and judgment unit has a displaying unit which displays information about a relation of the first luminance signal to be classified the defects (See Fig. 4).

**Claim 10**

Ishimaru et al. (2001/0030296) further discloses the comparison and judgment unit has a displaying unit for displaying information about a relation of the second luminance signal to discriminate a defect (See Fig. 4).

**Claim 11**

The reference of Ishimaru et al. (2001/0030296) further discloses the comparison and judgment unit has a displaying unit for plotting a relation between the first luminance signal and the second luminance signal, which have been converted by the photoelectric conversion means of the detection optical system, on a correlation diagram, where a horizontal axis and a vertical axis are expressed by logarithm values, to display the relation (See Fig. 5).

**Claim 12**

Ishimaru et al. (2001/0030296) discloses in the illumination optical system, a point incident-illuminated by the incident illumination system and a point oblique-illuminated by the oblique illumination system, which are on the surface of the object to be inspected, are configured to be different from each other in a visual field of the detection optical system (See Fig. 1).

**Claim 26**

Ishimaru et al. (2001/0030296) discloses a high-angle illumination light onto a surface of an object to be inspected with desired luminous flux from a high-angle relative to the surface of

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the object, and low-angle illumination light onto the surface of the object to be inspected with desired luminous flux from a low-angle relative to said high-angle illumination (Page 2, Para 0015); detecting by, condensing light scattered from the surface of the object by the illumination of the high-angle illumination and the low-angle illumination; and receiving the scattered light from the condensing, and converting the scattered light into a first luminance signal corresponding to said light illuminated by said high-angle illumination and a second luminance signal corresponding to said light illuminated by said low-angle illuminating (Page 9, Para. 0095); and comparing and judging (Fig. 1, Ref. 8) to classify defects on the object to be inspected into scratches, thin film-like foreign materials and convex defects by using the first luminance signal and the second luminance signal, which have been converted by the converting operation (Page 10, Para. 0098-0100).

#### **Claim 29**

Ishimaru et al. (2001/0030296) discloses high-angle illumination light onto a surface of an object to be inspected with desired luminous flux from a high-angle relative to the surface of the object (Page 2, Para 0015); and low-angle illumination light onto the surface of the object to be inspected with desired luminous flux from a low-angle relative to said high-angle illumination (Page 2, Para. 0015), detecting by (Page 4, Para. 0062) condensing light scattered from the surface of the object by the illumination of the high-angle illumination and the low-angle illumination: and receiving the scattered light from the condensing, and converting the scattered light into a first luminance signal corresponding to said light illuminated by said high-angle illumination and a second luminance signal corresponding to said light illuminated by said low-angle illumination (Page 4, Para. 0062); comparing and judging (Fig. 1, Ref. 8) to classify

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defects on the object to be inspected into scratches, thin film-like foreign materials and convex defects by using the first luminance signal and the second luminance signal, which have been converted by the converting operation; and supplying the fabrication process with information of the scratches, thin film-like foreign materials and convex defects, which have been judged in the defect inspection process, as feedback (Page 10, Para. 0098-0100).

***Allowable Subject Matter***

4. Claims 13-23, 27 are allowed over the prior art of record.
5. Claim 3 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.
6. The following is a statement of reasons for the indication of allowable subject matter:  
  
Regarding claims 13, 27 the prior art fails to disclose or make obvious an apparatus or method for defect inspecting having an incident illumination system that incident-illuminates illumination light including UV light or DUV light at a point on a surface of the object to be, which is mounted on the, with desired luminous flux from a normal line direction relative to the surface or from a direction in proximity to the normal line; and a oblique illumination system that oblique-illuminates illumination light including UV light or DUV light, which has a wavelength different from that of said incident-illuminated illumination light, at a point on the surface of the object to be inspected with desired luminous flux, and in combination with the other recited limitations of claims 13, 27. Claims 14-23 are allowed by the virtue of dependency on the allowed claim 13.



***Response to Arguments***

Applicant's arguments see amendment, filed August 5, 2004, with respect to claims 1-12, 26, 29 have been fully considered and are not persuasive.

Applicant's position is that the prior art of Ishimaru et al. (2001/0030296) fails to disclose classifying defects on the object to be inspected into scratches, thin film-like foreign materials and convex defects on pages 19-20 of applicant's amendment.

The examiner's position is that the reference of Ishimaru et al. (2001/0030296) fully discloses the broad classifying groups as shown on pages 2-3, Para. 0017. First it discloses discriminating between very shallow small scratches (applicant's scratches) and further discriminate between linear large scratches (applicant's thin-film like foreign material) (examiner notes that a thin-film like material is formed in a linear large scratch from the material that is removed from the wafer and rests on the outer edge of the concave depression), and further discriminates between foreign objects (applicant's convex defects) as disclosed. It is well known that foreign objects come in all sizes and shapes, which also includes defects that are concave such as a glue drop, bubble, etc..., therefore the reference of Ishimaru et al. (2001/0030296) would see a concave defect as a foreign object and not a scratch, therefore classifying it as a foreign object. Therefore, it is the position of the examiner that the reference of Ishimaru et al. (2001/0030296) discloses applicant's three classification defects, being scratches, thin-film like material, and convex defects.

***Conclusion***

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

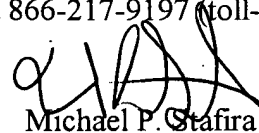
A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael P. Stafira whose telephone number is 571-272-2430. The examiner can normally be reached on 4/10 Schedule Mon.-Thurs..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory Toatley can be reached on 571-272-2800 ext. 77. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Michael P. Stafira  
Primary Examiner  
Art Unit 2877

October 12, 2004